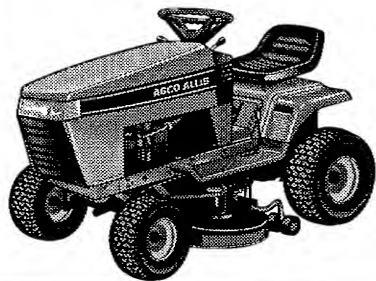


# 512 SERIES

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**AGCO ALLIS**

## **BATTERY MAINTENANCE**

### **Checking Battery Fluid**

1. Raise the seat.
2. Remove battery filler caps (C, figure 26), one at a time.
3. Fluid must be even with split ring full mark (figure 26). If not, add distilled water.
4. Reinstall filler caps.

### **Cleaning the Battery Cables**



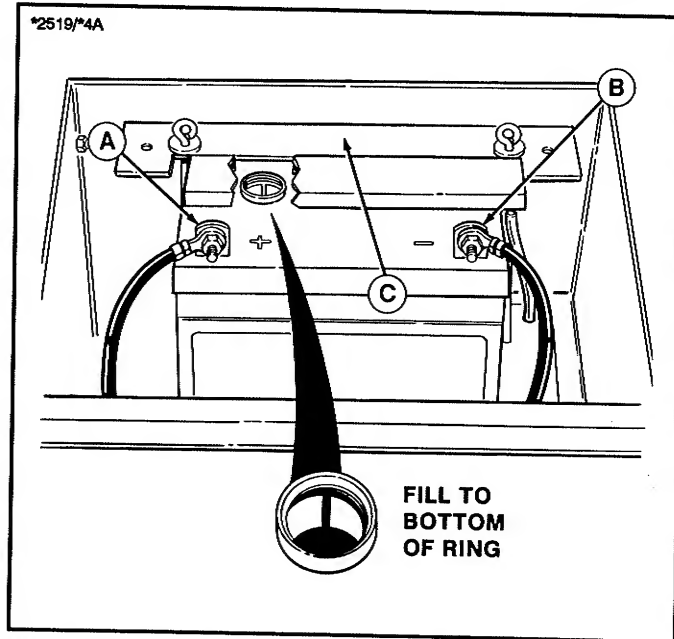
#### **WARNING**

**Be careful when handling the battery. Avoid spilling electrolyte. Keep flames and sparks away from the battery.**



#### **WARNING**

**When removing or installing battery cables, disconnect the negative cable FIRST and reconnect it LAST. If not done in this order, the positive terminal can be shorted to the frame by a tool.**



**Figure 26. Battery**  
**A. Positive Terminal**  
**B. Negative Terminal**

**C. Battery Clamp**

1. Disconnect the cables from the battery, negative cable first (figure 26).
2. Remove the battery clamp, then remove the battery.
3. Scrub the battery, cables, and battery compartment with baking soda and water.
4. Clean the battery terminals and cable clamps with a wire brush.
5. Reinstall battery and clamp (figure 26).
6. Connect cables, positive cable first.
7. Coat cable clamps and terminals with grease or petroleum jelly.

## Storage

---

### NORMAL STORAGE

Clean all grass and dirt from the mower. To protect your tractor, store it in an enclosed dry area. Do not store it in an enclosure where fumes from the fuel tank could reach an open flame. Clean the seat with a vinyl cleaner.

To store your tractor in a cold area between winter snow removal jobs, we suggest that you fill the fuel tank at the completion of each job to prevent water condensation in the fuel tank. Wait for engine to cool before filling tank.

### OFF-SEASON STORAGE (TWO MONTHS OR MORE)

1. Prepare the mower for storage as follows:
  - a. Remove mower from tractor.
  - b. Clean underside of mower.
  - c. Coat all bare metal surfaces with paint or light coat of oil to prevent rusting.
  - d. Clean, sharpen and balance the blades.
2. Add a gasoline stabilizer to the tank.



#### **WARNING**

**Gasoline is highly flammable. Keep open flame or spark away from gasoline and fuel tank. Never store tractor where gasoline fumes may reach an open flame or spark.**

3. Drain crankcase oil while engine is hot and refill with a grade of oil that will be required when tractor is used again.
4. Remove spark plug. Pour one ounce of 10W-30 oil into engine through spark plug hole. Crank engine a few times to distribute oil and then reinstall the spark plug.

5. Clean any dirt or grass from cylinder head cooling fins and engine housing and clean air cleaner element.
6. Cover air cleaner and exhaust outlet tightly with plastic or other waterproof material to keep moisture, dirt and insects out of engine.
7. Completely grease and oil tractor as outlined in earlier part of this section.
8. Clean up tractor and apply paint or rust preventive to any areas where paint is chipped or damaged.
9. Be sure the battery is filled to the proper level with water and is fully charged. Battery life will be increased if it is removed and put in a cool, dry place and fully charged about once a month. If battery is left in tractor, disconnect the negative cable.
10. If the tractor is to be stored 6 months or longer block the tractor up off the wheels to relieve weight and keep the tires off a damp floor. Protect the tires from prolonged exposure to direct sunlight.
11. Store the tractor in a dry place indoors.

## **STARTING AFTER STORAGE**

Before starting the tractor after it has been stored, do the following:

1. Remove the blocks from under the tractor.
2. Install the battery (if removed).
3. Unplug the exhaust outlet and air cleaner.
4. Remove spark plug and wipe it dry. Crank the engine a few times to blow excess oil out of the plug hole. Reinstall plug.
5. Fill fuel tank with fresh gasoline. See engine manual for recommendations.
6. Check crankcase oil level, and add proper oil if necessary.
7. Inflate tires to proper operating pressure. Check fluid levels.
8. Start the engine and let it run slowly. **DO NOT** run at high speed immediately after starting. Be sure to run engine only out of doors or in well ventilated area.

# Troubleshooting & Repair

---

## SECTION CONTENT

This section of the manual provides troubleshooting and repair instructions for the more common and easily corrected problems. For other problems, it is recommended that you contact your dealer.



### WARNING

**To avoid serious injury, perform maintenance on the tractor or mower only when the engine is stopped and the parking brake engaged. Always remove the ignition key, disconnect spark plug wire and fasten away from the plug before beginning the maintenance to prevent accidental starting of the engine.**

## TROUBLESHOOTING PROCEDURES

To use these procedures, first locate the problem description that best describes the trouble that you have encountered. Check the possible causes one at a time in the order that they are listed.

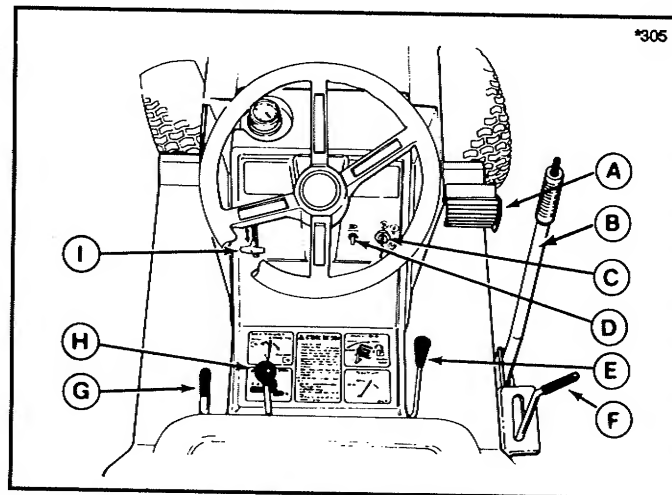
### 1. Engine will not start.

- A. Ground speed control lever not in neutral start position. Shift into NEUTRAL.
- B. Clutch/brake pedal not fully depressed. Depress fully.
- C. Operator not seated. Operator must be in seat on models equipped with seat switch.
- D. Out of fuel. Refill fuel tank.
- E. Engine flooded. Move control out of choke & attempt to start.
- F. Circuit breaker tripped. Wait one minute for automatic reset. Replace if defective (see your dealer).
- G. Battery terminals require cleaning. See Normal Care section.
- H. Battery discharged or dead. Recharge or replace.
  - I. Wiring loose or broken. Visually check wiring & replace broken or frayed wires. Tighten loose connections.
  - J. Solenoid or starter motor faulty. Repair or replace.
  - K. Safety interlock switch faulty. Replace if needed. (See your dealer.)
  - L. PTO clutch lever not disengaged. Disengage fully.

## STARTING THE ENGINE

Refer to figure 11.

1. Seat yourself on the tractor seat in the operating position. Set the parking brake using the clutch/brake pedal (A).
2. Set engine speed control (I) to CHOKE. A warm engine may not require choking.
3. Lift the PTO lever (G) as far as it will go to the rear to disengage the attachment
4. Set the ground speed control lever (H) in NEUTRAL.
5. Insert the key into the ignition switch (C) and turn it to START.
6. Move the engine speed control (I) to SLOW. Warm up the engine by running it for at least a minute before engaging the PTO lever or driving the tractor.



**Figure 11. Tractor & Mower Controls**

- A. Clutch/Brake Pedal**
- B. Large Lift Lever - (Optional)**
- C. Ignition Switch**
- D. Light Switch**
- E. Small Lift Lever (Standard)**
- F. Mower Height Control Lever**
- G. PTO (Power Take-Off) Lever**
- H. Ground Speed Control Lever**
- I. Engine Speed Control**

### SELECTING GROUND SPEED & ENGINE SPEED

On hydro models, ground speed is infinitely variable according to how far the control lever (H, figure 11) is pushed in the forward or reverse position.

On gear models, ground speed is selected by moving the control lever (H, figure 11) to the appropriate gear selection. Most mowing is done in 3rd or 4th gear with engine speed between 3/4 and full speed. If the terrain is rough, hilly or sloping, use first or second gear. If the grass is wet or over three inches (76mm) high, use full engine speed (with low gear) so the mower will have enough power to cut the grass. Shift gears only with tractor stopped and clutch/brake pedal fully depressed.



#### **WARNING**

**Make sure desired direction is clear of objects, people and animals.**

1. If you are ready to mow, set the mower to the desired cutting height using mower height adjuster (F, figure 11).
2. Engage the mower PTO using lever (G, figure 11) with moderately fast motion. Engaging the PTO too slowly may cause belt wear.
3. Set engine speed control (I, figure 11) for 1/3 to 1/2 speed. Select the gear best suited for conditions.
4. Release parking brake by depressing clutch/brake pedal (A, figure 11) & unlatching pedal from the footrest.
5. On hydro models, move the ground speed control lever (H, figure 11) to the desired direction and speed of travel to start tractor in motion.  
On gear models, depress clutch/brake pedal to disengage clutch. Use the ground speed control lever (H, figure 11) to select the gear best suited for conditions, then slowly release clutch/brake pedal to engage clutch and start tractor in motion.
6. Adjust engine speed control (I, figure 11) to desired speed. Between 3/4 and full speed is recommended for mowing.



## STOPPING THE TRACTOR

1. On hydro models, move the ground speed control lever (H, figure 11) into the NEUTRAL position to make a gradual stop. To make a more rapid stop, depress the clutch/brake pedal (A, figure 11). If you stop by depressing the pedal, move ground speed control lever to NEUTRAL before releasing the pedal.

**NOTE:** Tractor Mfg. Nos., 1692259 & 1692263 will return to neutral automatically from forward speeds when clutch/brake pedal is depressed.

On gear models, press the clutch/brake pedal (A, figure 11) down only far enough to disengage the clutch (as shown in figure 10) to make a gradual stop. For a more rapid stop, press pedal down farther to apply the brake.

2. Engage the parking brake by locking clutch/brake pedal on footrest as shown in figure 10.
3. Disengage the PTO and lower the attachment.
4. Set engine speed control (I, figure 11) to SLOW. Stopping a hot engine too fast may cause engine damage. Let engine idle for about a minute.
5. Turn key to OFF and remove it.



### WARNING

Before leaving the operator's position for any reason, engage the parking brake, disengage the PTO, stop the engine and remove the key.



### WARNING

To reduce fire hazard, keep the engine, tractor and mower free of grass, leaves and excess grease. Do not stop or park tractor over dry leaves, grass or combustible materials.

## Mowing Pattern & Tips

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For the first use of the mower choose a smooth level area. Cut long straight strips overlapping slightly.

The size and type of area to be mowed determines the best mowing pattern to use. Obstructions such as trees, fences and buildings must also be considered. Where possible, make one or two passes in a clockwise direction around the outside of the area to keep the cut grass off fences and walks. The remainder of the mowing should be done in a counterclockwise direction so the clippings are dispersed on the cut area.

Keep in mind the following lawn care and mowing tips:

1. Too much maintenance is as detrimental to your lawn as neglect.
2. Mow when grass is 3-5 inches tall. Don't cut shorter than 2 to 2-1/2 inches. Cut only the top one-third of the grass blade. Cutting below this level can lead to thatch problems. Your mower has a cutting height adjustment that can help you maintain a proper length.
3. For extremely tall grass, set the cutting height at maximum for the first pass, and then reset to the desired height and mow again.
4. Mow often. Short clippings of an inch or less decompose more quickly than longer blades.
5. Keep the blades on your mower sharp for finer clippings.
6. Let grass grow a bit longer when it is hot to reduce heat build-up and protect grass from heat damage.
7. Use slow-release fertilizer for slow, even growth.

8. Don't cover grass surface with a heavy layer of clippings. Consider using a grass collection system and starting a compost pile.
9. Aerate lawn in spring, consider renting an aerator which removes cores of soil from the lawn. This increases the speed of clipping decomposition and deep root growth by opening up the soil and permitting greater movement of water, fertilizer and air.
10. Don't over-water - too much water can encourage disease development.
11. Mow when the grass is dry, preferably in the late afternoon when the temperatures are cooler.
12. Where possible, change patterns occasionally to eliminate matting, graining or a corrugated appearance.
13. For wet grasses, grasses prone to wheel tracking and for collecting clippings:
  - a. Use sharp blades.
  - b. Raise deck 1/4" higher in front than in rear.
  - c. Maximum engine speed.
  - d. Clean deck of built-up material/caked-on grass.
  - e. Check for free movement of mower idler pulley.
  - f. Use slow ground speed.
14. For dry conditions where grass blow-out is a problem:
  - a. Use sharp blades.
  - b. Raise deck flat to 1/8" maximum lower in front.
  - c. Use 3/4 engine speed.
  - d. Clean deck of built-up material/caked-on grass.

## **MULCHING MOWER OPERATION (Optional Attachment)**

### **Mulching**

Mulching consists of actually cutting and recutting clippings into tiny particles and blowing them into the lawn. These tiny particles decompose rapidly into by-products your lawn can use. Under proper conditions, your mulching mower will virtually eliminate noticeable clippings on the lawn surface.

Keep in mind these mulching tips:

- a. Use mulching mower or mulcher kit without shredders for grass mulching.
- b. Install shredders for leaf shredding.
- c. Use maximum engine speed.
- d. Raise height of cut if excessive power is used.
- e. Must use sharp blades. Do not use lift tabs or high lift blade when mulching.
- f. Adjust to lower ground speeds in heavy grass or if windrow is present.
- g. Clean deck of built-up material/caked-on grass.
- h. Check for free movement of mower idler pulley.

### **Clippings Are Beneficial**

A common misconception about clippings is that they automatically lead to thatch. However, clippings produced by the mulching methods actually contribute to a healthy lawn because they:

1. Act as a safe, non-polluting and inexpensive fertilizer that nourishes your lawn. Fresh cut blades are a rich source of nitrogen which is essential to lush growth. And one garbage bag of clippings contains about 1/4 lb. of usable organic nitrogen.
2. Reduce the evaporation of water from your lawn.
3. Provide a cushioning layer to reduce lawn wear.
4. Moderate soil temperature.
5. Save money normally spent on trash bags.

### **Mowing Conditions**

The best mulching results from mowing when lawn is dry and grass blades are not over 5" long. Follow these guidelines for best results:

- a. Do not use the mower as a mulching mower during the first two or three mowings in the spring. The long grass blades, quick growth, and often wetter conditions are more suitable for side-discharge (broadcasting) or grass bagging operation.

*(Continued on next page)*

## RAISING THE HOOD & SEAT DECK

1. To raise the hood, grasp both sides of the hood (A, figure 14) near the dash and pull outward. Pivot the hood up and forward.



### CAUTION

Do not run the engine with the hood raised. Engine heat can cause damage to the headlight bezel & hood.

2. To open the seat deck, pull down the latch (B, figure 14) located ahead of the left rear wheel, and tilt seat deck back.

## CHECKING/ADDING GASOLINE



### CAUTION

Never use gasoline containing METHANOL, gasohol containing more than 10% ethanol, gasoline additives, premium gasoline, or white gas because engine/fuel system damage could result.

Check the gas gauge/cap to be sure there is enough gasoline to complete the job. To add gasoline, remove the gas gauge/cap. Refer to your engine manual for gasoline recommendations. Install and hand tighten the gas gauge/cap.

## CHECKING TIRE PRESSURE

Front tire pressure should be 12 to 15 psi (82 to 103 kPa).  
Rear tire pressure should be 6 to 8 psi (41 to 55 kPa).

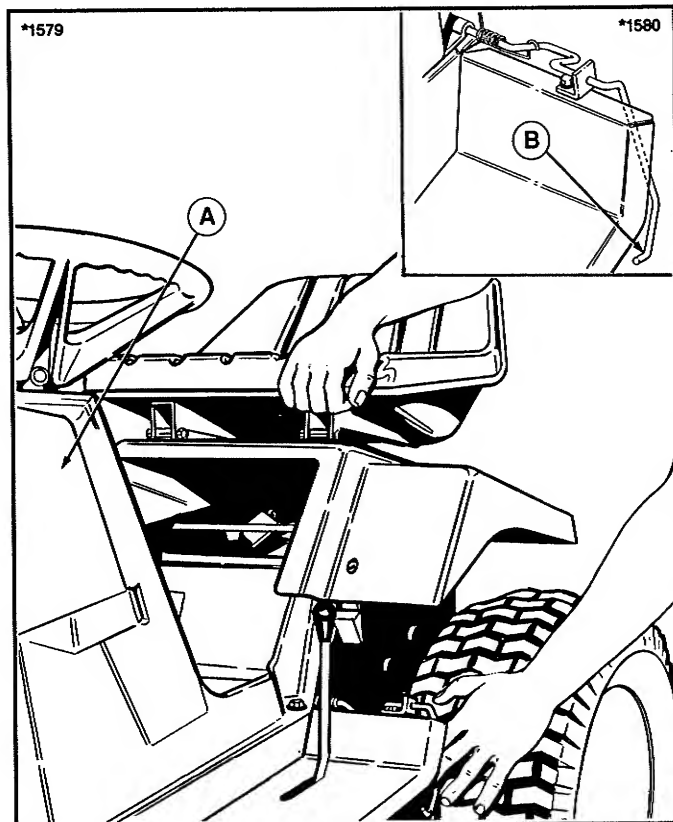


Figure 14. Operating the Seat Deck  
A. Hood B. Latch

## CHECKING FUEL FILTER



### WARNING

Do not remove fuel filter when engine is hot, as spilled gasoline may ignite. Do Not spread hose clamps further than necessary. Ensure clamps grip hoses firmly over filter after installation.

The fuel filter is located in fuel line between fuel tank and carburetor. If filter is dirty or clogged, replace as follows. Place a container below filter to catch spilled gasoline.

1. Using a pliers, open and slide hose clamps from fuel filter.
2. Remove hoses from filter.
3. Install new filter in proper flow direction in fuel line. Secure with hose clamps. See warning at beginning of procedure.

## LUBRICATION

### Lubricating the Tractor

Lubricate the tractor as shown in figures 15 - 20. When a grease gun is shown, wipe the fitting clean, apply two or three shots of lithium base automotive grease, and wipe off excess grease. When an oil can is shown, wipe the area clean, apply a few drops of oil (SAE 30), then wipe up drips or spills.

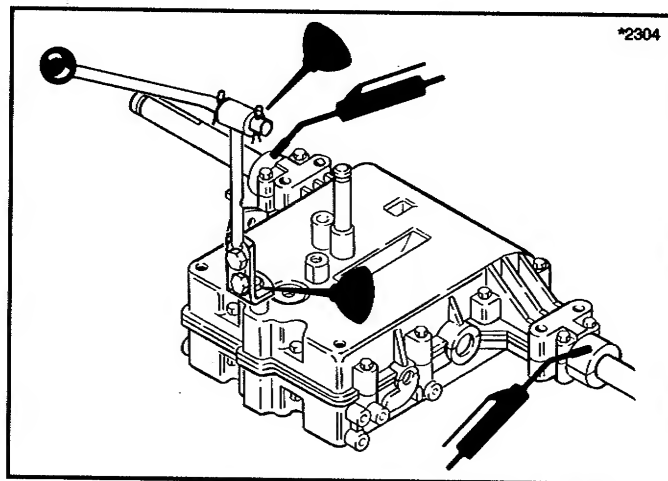


Figure 15. Shift Lever Lubrication - Gear Models

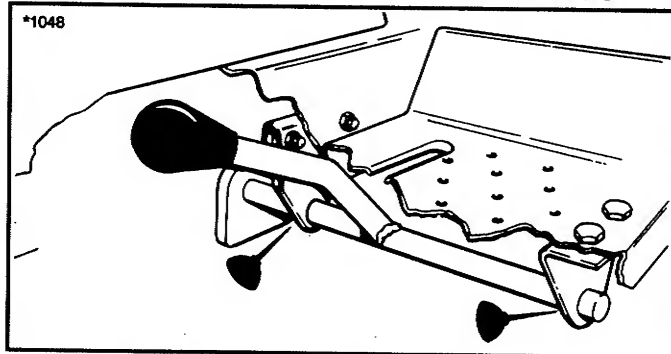
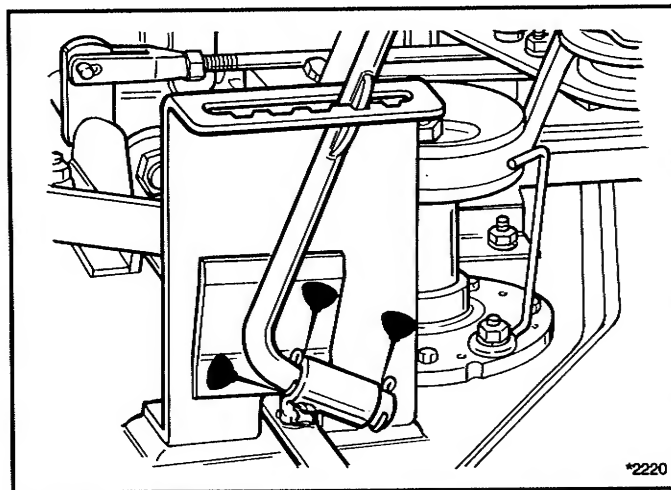


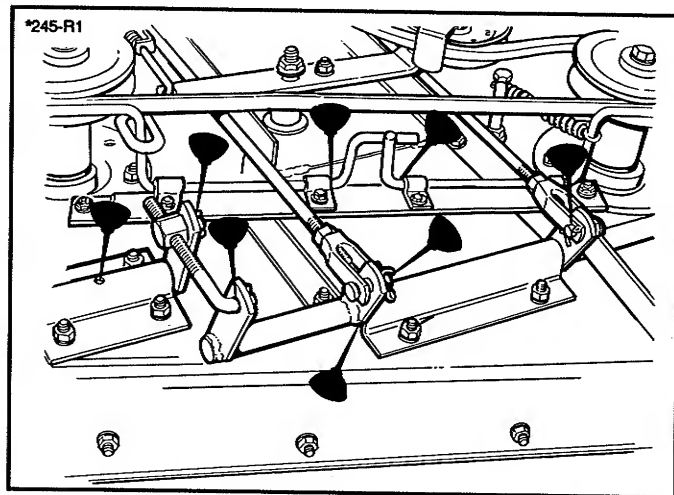
Figure 16. PTO Lever Lubrication

### **Lubricating the Mower**

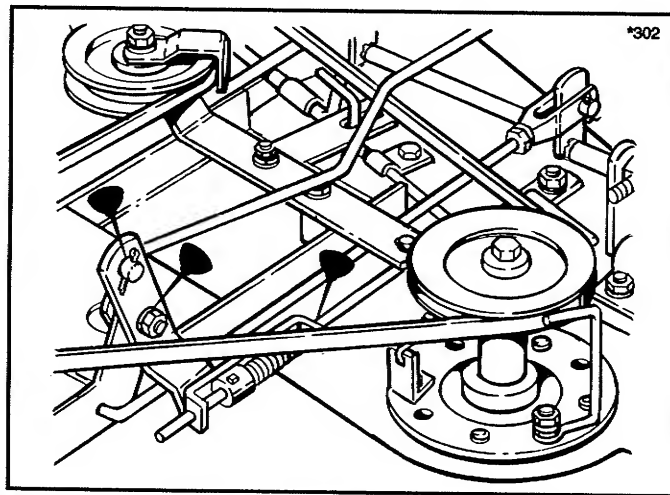
Lubricate the mower as shown in figures 21 - 23. Also lubricate the grease fittings on the mower idler pulley and arbors (underneath the mower deck). Use an oil can with medium weight (SAE 30) oil. Brush and wipe dirt and grass from the area before applying oil. Wipe up drips and spills. Keep oil off belts and pulleys.



**Figure 21. Lubricate Height Control Lever & Point Where Roller Bar Contacts Bracket**



**Figure 22. Lubricate Brake Lever, Clevises & Leveling Rod.**



**Figure 23. Lubricate Hitch, PTO Rod & PTO Arm**

## **BATTERY MAINTENANCE**

### **Checking Battery Fluid**

1. Raise the seat.
2. Remove battery filler caps (C, figure 26), one at a time.
3. Fluid must be even with split ring full mark (figure 26). If not, add distilled water.
4. Reinstall filler caps.

### **Cleaning the Battery Cables**



#### **WARNING**

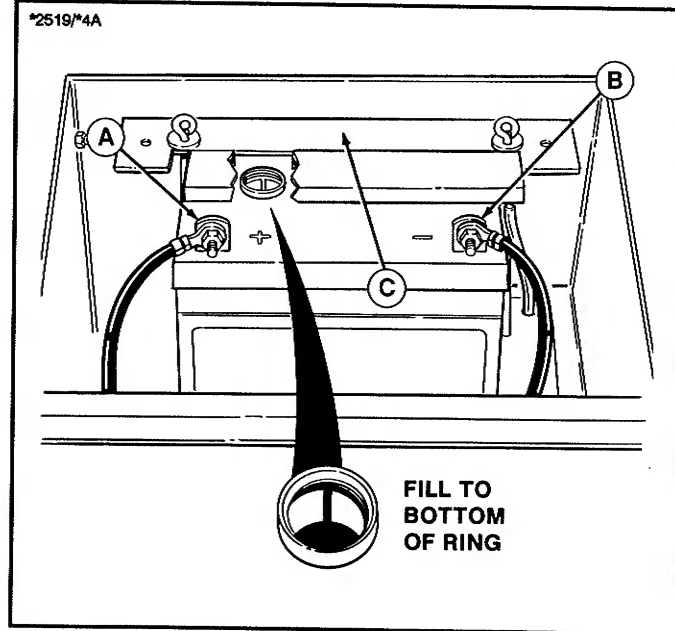
**Be careful when handling the battery. Avoid spilling electrolyte. Keep flames and sparks away from the battery.**



#### **WARNING**

**When removing or installing battery cables, disconnect the negative cable FIRST and reconnect it LAST. If not done in this order, the positive terminal can be shorted to the frame by a tool.**





**Figure 26. Battery**  
**A. Positive Terminal**  
**B. Negative Terminal**

**C. Battery Clamp**

1. Disconnect the cables from the battery, negative cable first (figure 26).
2. Remove the battery clamp, then remove the battery.
3. Scrub the battery, cables, and battery compartment with baking soda and water.
4. Clean the battery terminals and cable clamps with a wire brush.
5. Reinstall battery and clamp (figure 26).
6. Connect cables, positive cable first.
7. Coat cable clamps and terminals with grease or petroleum jelly.

## SERVICING THE MOWER BLADES

1. Remove mower from tractor.
2. Check both blades. Blades should be sharp and free of nicks and dents. If not, sharpen blades as described in following steps.



### WARNING

For your personal safety, do not handle the sharp mower blades with bare hands. Careless or improper handling of blades may result in serious injury.

3. To remove blade for sharpening, use wooden block to hold blade while removing its blade mounting capscREW (figure 27).
4. Use a file to sharpen blade to fine edge. Remove all nicks and dents in blade edge. If blade is severely damaged, it should be replaced.
5. Balance the blade as shown in figure 28. Center the blade's center hole on a nail lubricated with a drop of oil. A balanced blade will remain level.

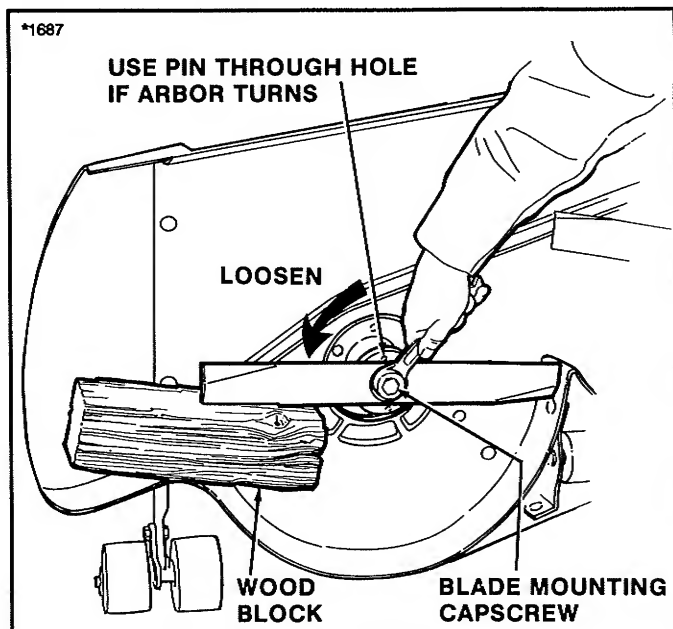


Figure 27. Removing the Blade

**WARNING**

For your personal safety, blade mounting capscrews must be installed with the cup washer and spline washer and then securely tightened. Torque blade mounting capscrew to 50 to 70 ft. lbs. (67 to 95 N.m).

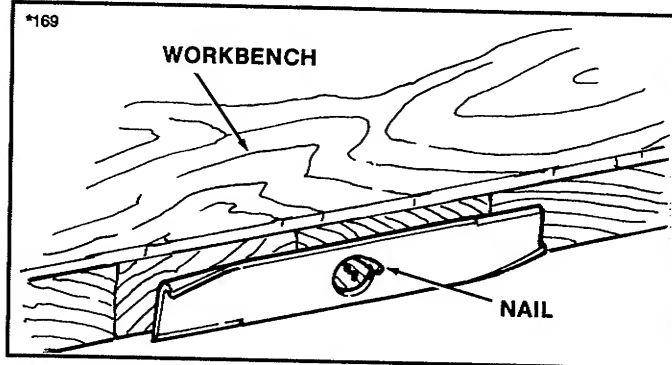


Figure 28. Balancing the Blade

6. Reinstall each blade with the tabs pointing up toward deck as shown in figure 29. Secure with a capscrew (D), cup washer (C), and spline washer (B). Be sure spline washer hub fits inside blade mounting hole. Use a wooden block to prevent blade rotation (figure 29) and torque capscrews from 50 to 70 ft. lbs. (67 to 95 N.m).

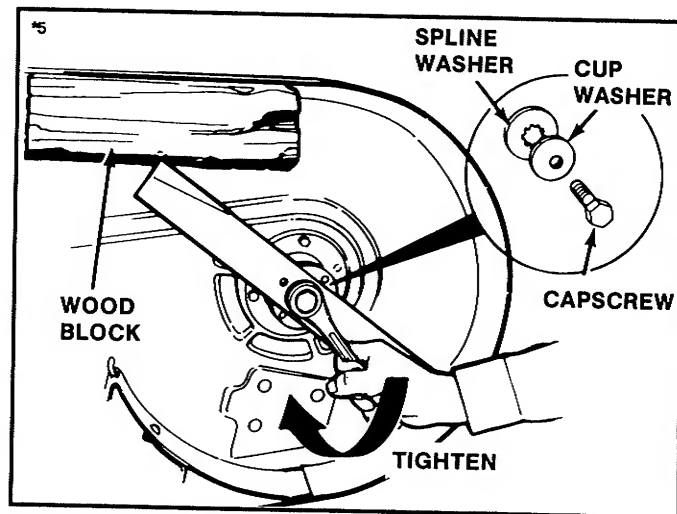


Figure 29. Installing the Blade

A. Wooden Block  
B. Spline Washer

C. Cup Washer  
D. Capscrew

## Storage

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### NORMAL STORAGE

Clean all grass and dirt from the mower. To protect your tractor, store it in an enclosed dry area. Do not store it in an enclosure where fumes from the fuel tank could reach an open flame. Clean the seat with a vinyl cleaner.

To store your tractor in a cold area between winter snow removal jobs, we suggest that you fill the fuel tank at the completion of each job to prevent water condensation in the fuel tank. Wait for engine to cool before filling tank.

### OFF-SEASON STORAGE (TWO MONTHS OR MORE)

1. Prepare the mower for storage as follows:
  - a. Remove mower from tractor.
  - b. Clean underside of mower.
  - c. Coat all bare metal surfaces with paint or light coat of oil to prevent rusting.
  - d. Clean, sharpen and balance the blades.
2. Add a gasoline stabilizer to the tank.



#### **WARNING**

**Gasoline is highly flammable. Keep open flame or spark away from gasoline and fuel tank. Never store tractor where gasoline fumes may reach an open flame or spark.**

3. Drain crankcase oil while engine is hot and refill with a grade of oil that will be required when tractor is used again.
4. Remove spark plug. Pour one ounce of 10W-30 oil into engine through spark plug hole. Crank engine a few times to distribute oil and then reinstall the spark plug.

5. Clean any dirt or grass from cylinder head cooling fins and engine housing and clean air cleaner element.
6. Cover air cleaner and exhaust outlet tightly with plastic or other waterproof material to keep moisture, dirt and insects out of engine.
7. Completely grease and oil tractor as outlined in earlier part of this section.
8. Clean up tractor and apply paint or rust preventive to any areas where paint is chipped or damaged.
9. Be sure the battery is filled to the proper level with water and is fully charged. Battery life will be increased if it is removed and put in a cool, dry place and fully charged about once a month. If battery is left in tractor, disconnect the negative cable.
10. If the tractor is to be stored 6 months or longer block the tractor up off the wheels to relieve weight and keep the tires off a damp floor. Protect the tires from prolonged exposure to direct sunlight.
11. Store the tractor in a dry place indoors.

## **STARTING AFTER STORAGE**

Before starting the tractor after it has been stored, do the following:

1. Remove the blocks from under the tractor.
2. Install the battery (if removed).
3. Unplug the exhaust outlet and air cleaner.
4. Remove spark plug and wipe it dry. Crank the engine a few times to blow excess oil out of the plug hole. Reinstall plug.
5. Fill fuel tank with fresh gasoline. See engine manual for recommendations.
6. Check crankcase oil level, and add proper oil if necessary.
7. Inflate tires to proper operating pressure. Check fluid levels.
8. Start the engine and let it run slowly. **DO NOT** run at high speed immediately after starting. Be sure to run engine only out of doors or in well ventilated area.

# Troubleshooting & Repair

---

## SECTION CONTENT

This section of the manual provides troubleshooting and repair instructions for the more common and easily corrected problems. For other problems, it is recommended that you contact your dealer.



### **WARNING**

**To avoid serious injury, perform maintenance on the tractor or mower only when the engine is stopped and the parking brake engaged. Always remove the ignition key, disconnect spark plug wire and fasten away from the plug before beginning the maintenance to prevent accidental starting of the engine.**

## TROUBLESHOOTING PROCEDURES

To use these procedures, first locate the problem description that best describes the trouble that you have encountered. Check the possible causes one at a time in the order that they are listed.

### **1. Engine will not start.**

- A. Ground speed control lever not in neutral start position. Shift into NEUTRAL.
- B. Clutch/brake pedal not fully depressed. Depress fully.
- C. Operator not seated. Operator must be in seat on models equipped with seat switch.
- D. Out of fuel. Refill fuel tank.
- E. Engine flooded. Move control out of choke & attempt to start.
- F. Circuit breaker tripped. Wait one minute for automatic reset. Replace if defective (see your dealer).
- G. Battery terminals require cleaning. See Normal Care section.
- H. Battery discharged or dead. Recharge or replace.
  - I. Wiring loose or broken. Visually check wiring & replace broken or frayed wires. Tighten loose connections.
  - J. Solenoid or starter motor faulty. Repair or replace.
  - K. Safety interlock switch faulty. Replace if needed. (See your dealer.)
  - L. PTO clutch lever not disengaged. Disengage fully.

M. Spark plug faulty, fouled, or incorrectly gapped.  
Clean & gap or replace.

N. Water in fuel tank. Drain fuel & refill with fresh fuel.

O. Old stale gas. Drain fuel & replace with fresh fuel.

## **2. Engine starts hard or runs poorly.**

A. Fuel mixture too rich. Move control out of choke. If problem still exists, clean air filter.

B. Carburetor adjusted incorrectly. See your engine manual.

C. Spark plug faulty, fouled, or incorrectly gapped.  
Clean and gap or replace.

## **3. Engine knocks.**

A. Low oil level. Check/add oil as required.

B. Using wrong grade oil. See Engine Manual.

## **4. Excessive oil consumption.**

A. Engine running too hot. Clean engine fins, blower screen and air cleaner. See Normal Care section.

B. Using wrong weight of oil. See Engine Manual.

C. Too much oil in crankcase. Drain excessive oil.

## **5. Engine exhaust is black or smoky.**

A. Dirty air filter. Clean air filter.

B. Choke not fully open. Move control out of choke and be sure choke opens fully. If problem still exists, check carburetor adjustment.

## **6. Engine runs, but tractor will not drive or lacks power.**

A. Ground speed control lever in NEUTRAL. Shift into forward or reverse gate.

B. Drive belt slips. (See problem and cause below.)

C. Check hydro transmission oil (hydro models).

D. Brake is not fully released.

E. Transmission release lever is not fully in drive position (hydro models). See Pushing The Tractor By Hand.

## **7. Drive belt slips.**

A. Clutch or belt tension is out of adjustment. See Adjustment section.

B. Pulleys or belt greasy or oily. Clean as required.

C. Belt stretched or worn. Replace with correct belt.

D. Clutch rod binding in guide. Oil clutch rod. See Tractor Lubrication.

### CHECKING THE BATTERY

The voltmeter can be used to determine condition of battery. When engine is off, the voltmeter shows battery voltage, which should be 12 volts. When engine is running, the voltmeter shows voltage of charging circuit which normally is 13 to 14 volts.

A dead battery or one too weak to start the engine may not mean the battery needs to be replaced. It may, as an example, mean that the alternator is not charging the battery properly. If there is any doubt about the cause of the problem, see your dealer. If you need to replace the battery, follow the steps under "Cleaning the Battery & Cables" in the Normal Care Section.

### CHARGING A COMPLETELY DISCHARGED BATTERY

1. Be aware of all the safety precautions you should observe during the charging operation. If you are unfamiliar with the use of a battery charger and hydrometer; have the battery serviced by your dealer.



#### WARNING

**Do not attempt to charge a frozen battery. Allow the battery to warm to 60° F (15.5° C) before placing on charge.**

2. Add water sufficient to cover the plate (fill to the proper level near the end of the charge). If the battery is extremely cold, allow it to warm before adding water because the water level will rise as it warms. Also, an extremely cold battery will not accept a normal charge until it becomes warm.
3. Always unplug or turn the charger off before attaching or removing the clamp connections.
4. Carefully attach the clamps to the battery in proper polarity (usually red to [+] positive and black to [-] negative).



#### CAUTION

**Keep open flames and sparks away from the battery; the gasses coming from it are highly explosive. Ventilate the battery well during charging.**



5. While charging, periodically measure the temperature of the electrolyte. If the temperature exceeds 125° F (51.6° C), or if violent gassing or spewing of electrolyte occurs, the charging rate must be reduced or temporarily halted to prevent battery damage.
6. Charge the battery until fully charged (i.e. until the specific gravity of the electrolyte is 1.250 or higher and the electrolyte temperature is at least 60° F). The best method of making certain a battery is fully charged, but not over charged, is to measure the specific gravity of a cell once per hour. The battery is fully charged when the cells are gassing freely at low charging rate and less than 0.003 change in specific gravity occurs over a three hour period.

### **JUMP STARTING WITH AUXILIARY (BOOSTER) BATTERY**

Jump starting is not recommended. However, if it must be done, follow these directions. Both booster and discharged batteries should be treated carefully when using jumper cables. Follow exactly the procedure that follows, being careful not to cause sparks. Refer to figure 30.



### **WARNING**

**For your personal safety, use extreme care when jump starting. Never expose battery to open flame or electric spark – battery action generates hydrogen gas which is flammable and explosive. Do not allow battery acid to contact skin, eyes, fabrics, or painted surfaces. Batteries contain a sulfuric acid solution which can cause serious personal injury or property damage.**

1. Both batteries must be of the same voltage (6, 12, etc.).
2. Position the vehicle with the booster battery adjacent to the vehicle with the discharged battery so that booster cables can be connected easily to the batteries in both vehicles. Make certain vehicles do not touch each other.
3. Wear safety glasses and shield eyes and face from batteries at all times. Be sure vent caps are tight. Place damp cloth over vent caps on both batteries.
4. Connect positive (+) cable to positive post of discharged battery (wired to starter or solenoid).

*(Continued on next page)*

5. Connect the other end of same cable to same post marked positive (+) on booster battery.
6. Connect the second cable negative (-) to other post of booster battery.
7. Make final connection on engine block of stalled vehicle away from battery. Do not lean over batteries.
8. Start the engine of the vehicle with the booster battery. Wait a few minutes, then attempt to start the engine of the vehicle with the discharged battery.
9. If the vehicle does not start after cranking for thirty seconds, STOP PROCEDURE. More than thirty seconds seldom starts the engine unless some mechanical adjustment is made.
10. After starting, allow the engine to return to idle speed. Remove the cable connection at the engine or frame. Then remove the other end of the same cable from the booster battery.
11. Remove the other cable by disconnecting at the discharged battery first and then disconnect the opposite end from the booster battery.
12. Discard the damp cloths that were placed over the battery vent caps.



### **WARNING**

**To avoid engine damage, do not disconnect battery while engine is running. Be sure terminal connections are tight before starting.**



### **WARNING**

**Any procedure other than the preceding could result in: (1) personal injury caused by electrolyte squirting out the battery vents, (2) personal injury or property damage due to battery explosion, (3) damage to the charging system of the booster vehicle or of the immobilized vehicle.**

**Do not attempt to jump start a vehicle having a frozen battery because the battery may rupture or explode. If a frozen battery is suspected, examine all fill vents on the battery. If ice can be seen or if the electrolyte fluid cannot be seen, do not attempt to start with jumper cables as long as the battery remains frozen.**

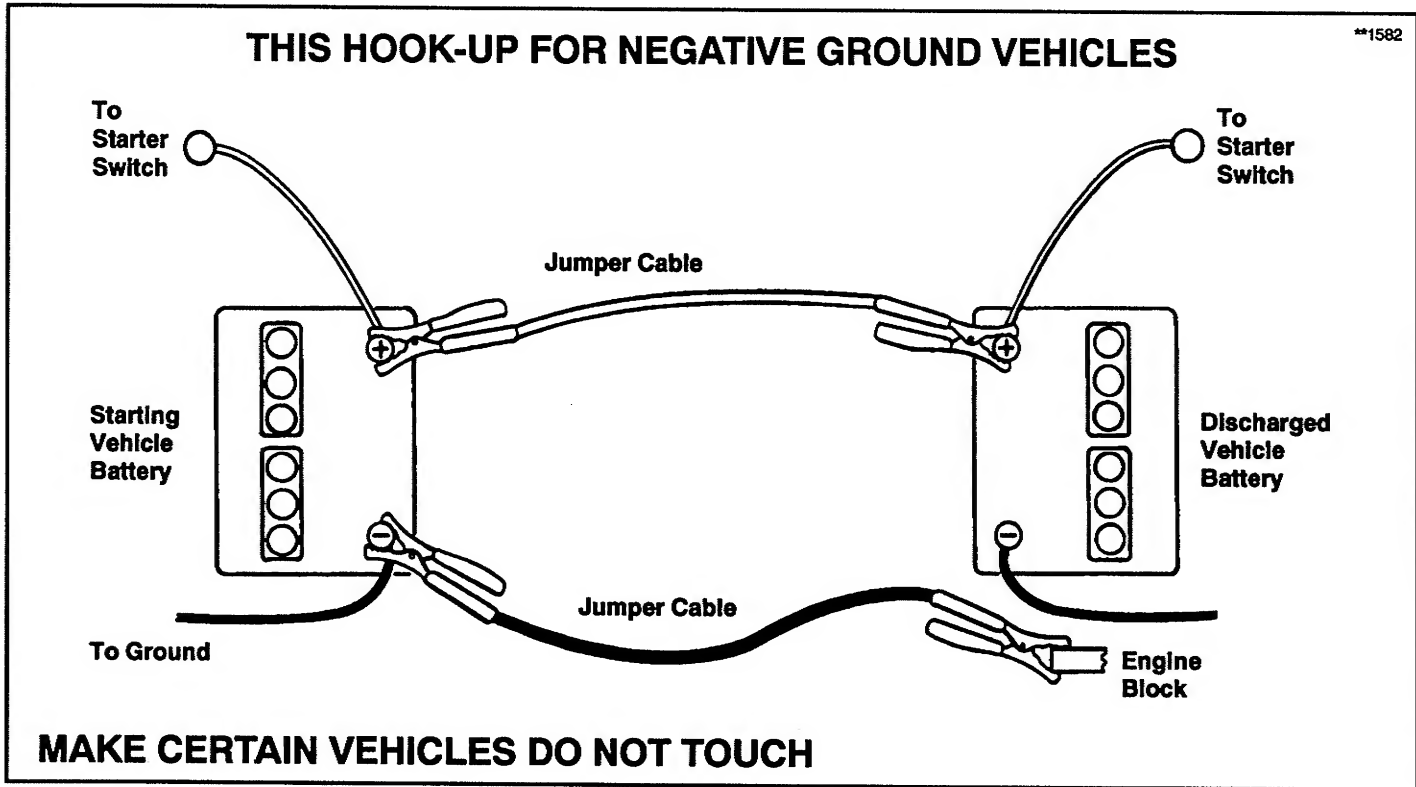


Figure 30. Jump Starting Diagram

## Adjustments

### SEAT ADJUSTMENT



#### WARNING

To avoid serious injury, perform adjustments only with engine stopped, key removed and tractor on level ground.

Raise the seat deck. While holding the seat, loosen the four capscrews (A, figure 31) securing seat to deck. Position the seat as desired, then tighten the capscrews.

Seat springs (B, figure 31) can be adjusted for operator comfort. Move springs forward for lighter operator and toward the rear for heavier operator.

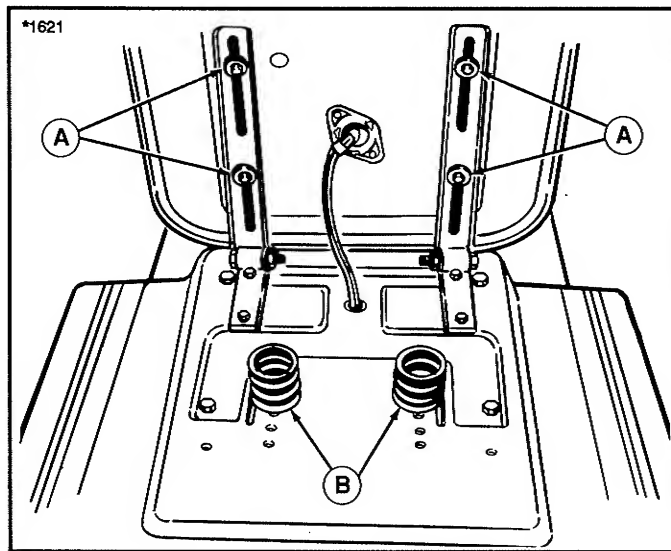


Figure 31. Seat Adjustment

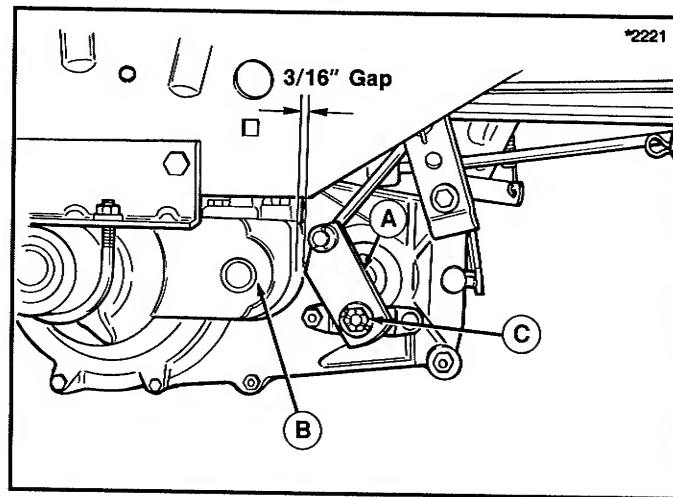
A. Capscrews

B. Springs

**BRAKE ADJUSTMENTS - HYDRO MODELS****Parking Brake Adjustment**

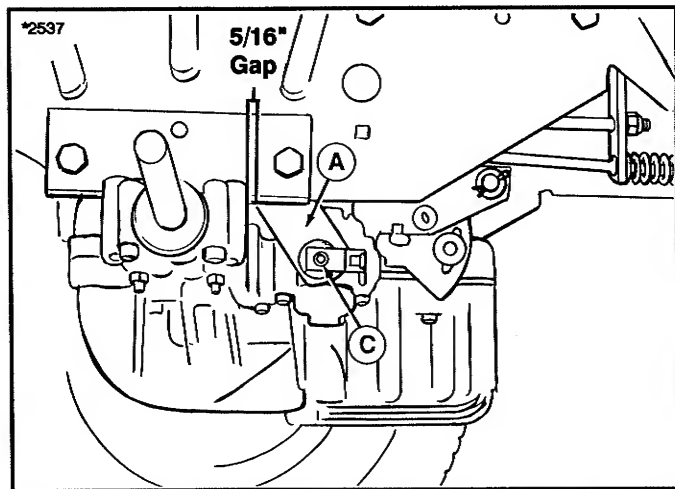
For hydro models (Mfg. Nos. 1692156, 1692164), refer to figure 32. For other hydro models, refer to figure 33.

1. With parking brake released, rotate the brake cam (A) forward until it stops. There should be gap between transaxle housing (B) and rear point of brake cam as shown in the figure.
2. If adjustment is required, remove cotter pin and turn adjusting nut (C) until proper clearance is achieved. Turning the nut in will decrease clearance and turning the nut out will increase clearance. Reinstall cotter pin after adjustment.



**Figure 32. Parking Brake Adjustment - Hydro Models (Mfg. Nos. 1692156, 1692164) (Viewed from right side of transaxle with rear wheel removed)**

- A. Brake Cam**  
**B. Transaxle Housing**  
**C. Adjusting Nut**



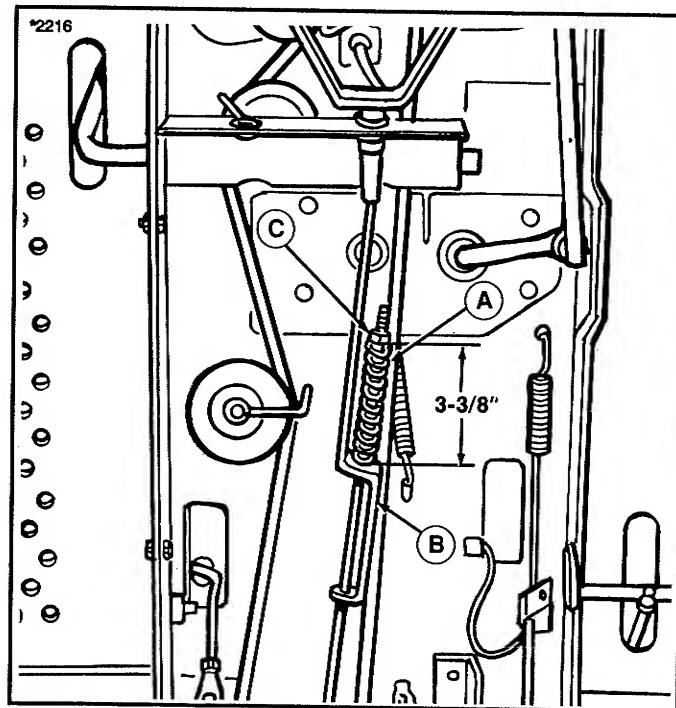
**Figure 33. Parking Brake Adjustment - Hydro Models (Mfg. Nos. 1692259, 1692263) (Viewed from left side of transaxle with rear wheel removed)**

- A. Brake Cam**
- B. Transaxle Housing**
- C. Adjusting Nut**

### Brake Spring Adjustment

For hydro models (Mfg. Nos. 1692156, 1692164), refer to figure 34. For other hydro models, refer to figure 35.

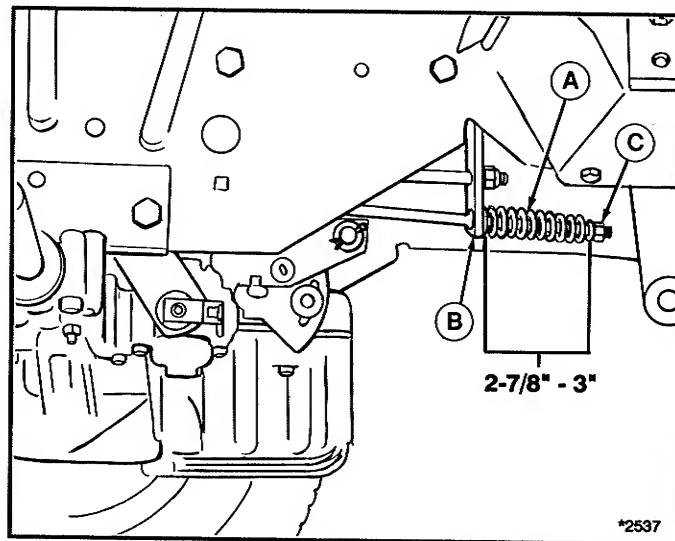
1. Depress the clutch/brake pedal and latch parking brake over footrest. When compressed, measure the brake spring (A) between the rod guide (B) and adjusting nut (C). Measurement should be as shown.
2. If adjustment is required, turn adjusting nut (C) until proper spring length is achieved.



**Figure 34. Brake Spring Adjustment - Hydro Models  
(Mfg. Nos. 1692156, 1692164)**

A. Brake Spring  
B. Rod Guide

C. Adjusting Nut



**Figure 35. Brake Spring Adjustment - Hydro Models  
(Mfg. Nos. 1692259, 1692263)**

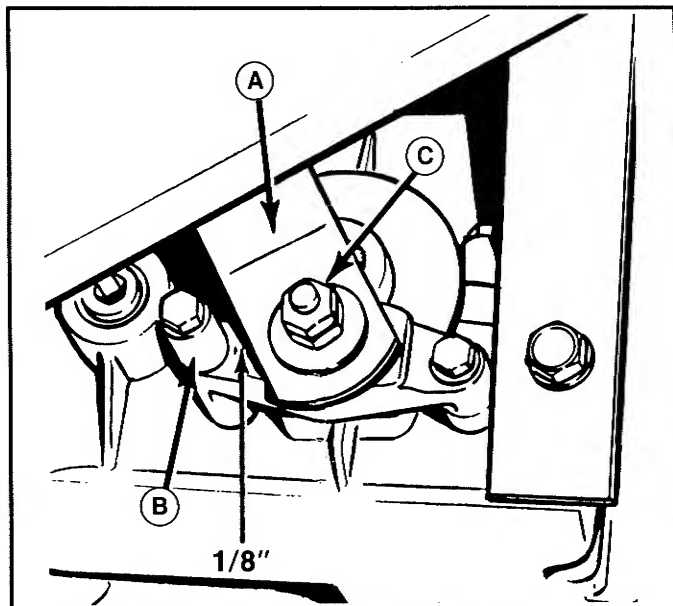
A. Brake Spring  
B. Rod Guide

C. Adjusting Nut

### BRAKE ADJUSTMENTS - GEAR MODEL

#### Parking Brake Adjustment

1. Place the transmission in gear and release the parking brake.
2. Move the brake rod (I, figure 37) back and forth to be sure there is no tension on the brake pads.
3. See figure 36. Push the cam lever (A) forward (toward front of tractor) to remove any slack. The gap between cam lever (A) and stop (B) should be  $\frac{1}{8}$ " (0.3mm). Use a feeler gauge to measure.
4. If adjustment is required, loosen or tighten the adjustment nut (C) to achieve correct dimension. Some models are equipped with two nuts. If so, loosen the outer nut, adjust the inner nut as necessary, then tighten the outer nut.



**Figure 36. Parking Brake Adjustment - Gear Model  
(Viewed from right side of transmission)**

- A. Brake Cam Lever**
- B. Stop**
- C. Adjustment Nut**

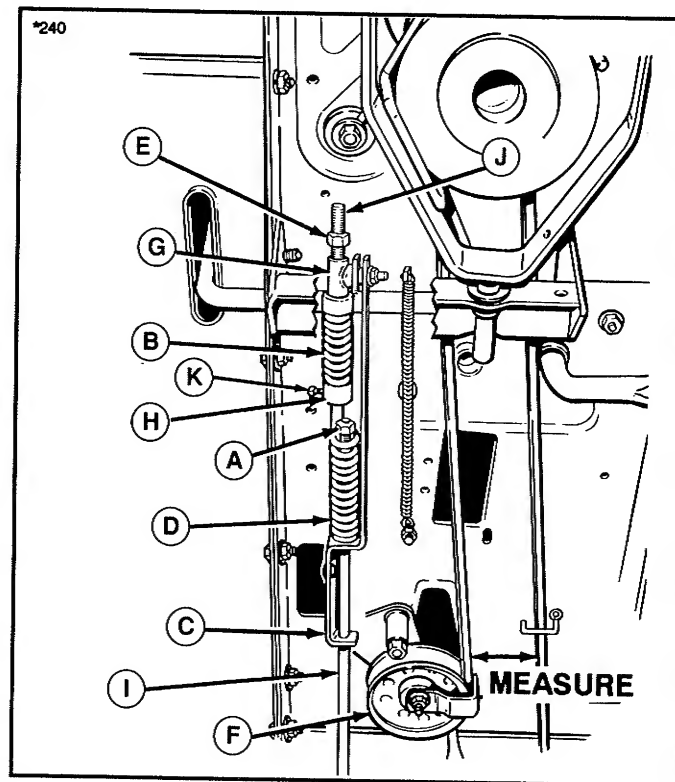


**Brake Spring Adjustment**

1. Make sure the brake cam lever is properly adjusted as described previously under Parking Brake Adjustment.
2. Fully depress clutch pedal and lock parking brake.
3. See figure 37. Adjust the brake rod nut (A) until spring (D) is compressed to 2-11/32" length.

**Figure 37. Clutch/Brake Adjustments - Gear Model**

- |                       |                     |
|-----------------------|---------------------|
| A. Nut                | G. Clutch Rod Guide |
| B. Spring, Clutch Rod | H. Set Collar       |
| C. Brake Rod Guide    | I. Brake Rod        |
| D. Spring, Brake Rod  | J. Clutch Rod       |
| E. Nut                | K. Setscrew         |
| F. Idler Pulley, Rear |                     |



### CLUTCH ROD ADJUSTMENT - GEAR MODEL

Refer to figure 37.

1. Release clutch/brake pedal so parking brake is not locked.
2. Apply 15-20 lbs. pressure to pedal to firmly seat transmission drive belt in idler pulley (F). Measure the distance between the inside belt strands as shown in figure 37. Distance should be between 2-3/4" and 3-3/8".
3. If adjustment is required, loosen rear idler pulley (B, figure 56). Move rear pulley rearward to increase distance and move pulley forward to decrease distance.

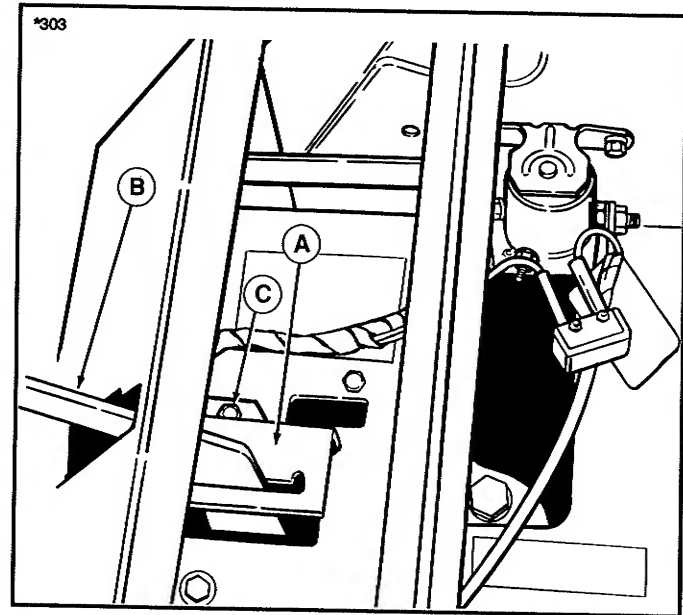
**NOTE:** For smooth operation, the drive system is designed to allow some belt slippage at transmission drive pulley when clutch pedal is released. In the following adjustment, less belt slippage can be obtained by slightly reducing the 2-7/16" dimension.

4. Make sure spring (B) is seated against rod guide (G) and set collar (H). Apply 15-20 lbs. pressure to pedal to position belt firmly in idler pulley.
5. Push set collar (H) against spring (B) to compress spring to 2-7/16" and tighten setscrew. Release idler pulley and check dimension.
6. If adjustment is required, apply parking brake, loosen setscrew (K), reposition set collar (H) and tighten setscrew (K). Release parking brake and check dimension. Repeat until 2-7/16" dimension is achieved.
7. Measure distance between rod guide (G) and nut (E). Distance should be 5/8". turn nut as required to correct distance.

**NEUTRAL ADJUSTMENT - HYDRO MODELS (Mfg. Nos. 1692156, 1692164)**

If the tractor creeps forward or backward with ground control speed lever positioned in the neutral gate, perform the following adjustment.

1. Raise rear of tractor off ground with suitable hoist or floor jack. Install jackstands underneath transaxle and block the front wheels.
2. See figure 38. Raise the seat deck. The control lever quadrant (A) is mounted with slotted holes so it can be adjusted. Loosen the two self-tapping screws (C) and move the quadrant so the screws are centered in the quadrant slots. Tighten the screws securely.
3. Place speed control lever (B) in the NEUTRAL gate. Start the engine and run at maximum RPM.



**Figure 38. Ground Speed Control Lever - Hydro Models (Mfg. Nos. 1692156, 1692164)**

**A. Quadrant**

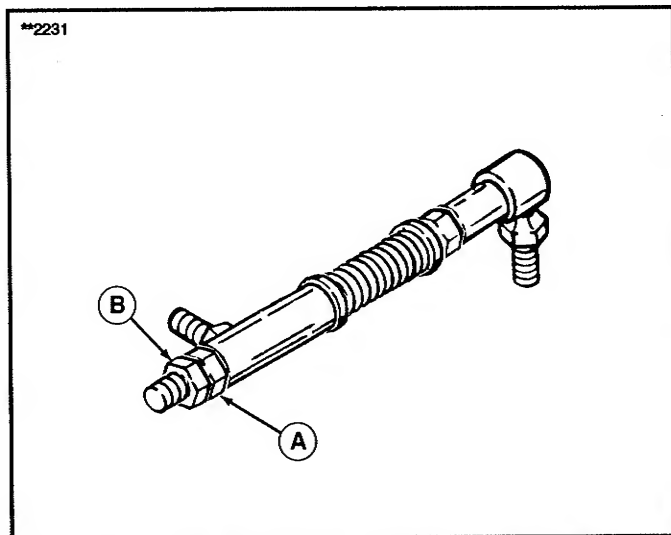
**B. Ground Speed Control Lever**

**C. Taptite Screw**

*(Continued on next page)*

## Adjustments

4. See figure 39. Loosen jam nut (B) and adjust control link length by rotating nut (A) in either direction until wheels stop rotating. Snug jam nut (B) finger tight against nut (A).
5. Check for neutral from forward and reverse with ground speed control lever (B, figure 38). Repeat steps 3 - 4 if necessary.
6. Hold the adjustment nut (A) and tighten jam nut (B) securely against nut (A)
7. Shut off the engine and remove tractor from jackstands or jack.

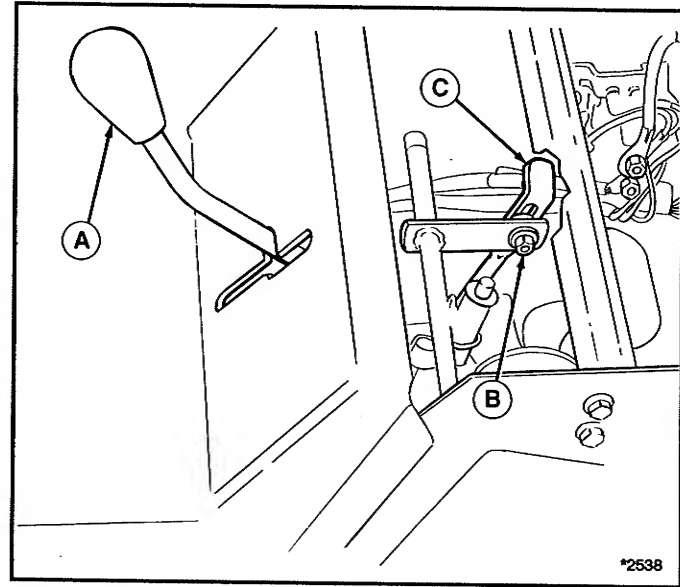


**Figure 39. Control Linkage - Hydro Models (Mfg. Nos. 1692156, 1692164)**

**NEUTRAL ADJUSTMENT - HYDRO MODELS (Mfg. Nos. 1692259, 1692263)**

If the tractor creeps forward or backward with ground control speed lever positioned in the neutral gate, perform the following adjustment.

1. Raise rear of tractor off ground with suitable hoist or floor jack. Install jackstands underneath transaxle and block the front wheels.
2. See figure 40. Place speed control lever (A) in the NEUTRAL gate. Start the engine and run at maximum RPM.
3. Raise the seat deck. Loosen nut (B) and adjust linkage rod (C) up or down until wheels stop rotating, then tighten nut (B) securely.
4. Turn off the engine and remove tractor from jack stands or jack.



**Figure 40. Ground Speed Control Lever - Hydro Models (Mfg. Nos. 1692259, 1692263)**

**A. Ground Speed Control Lever**

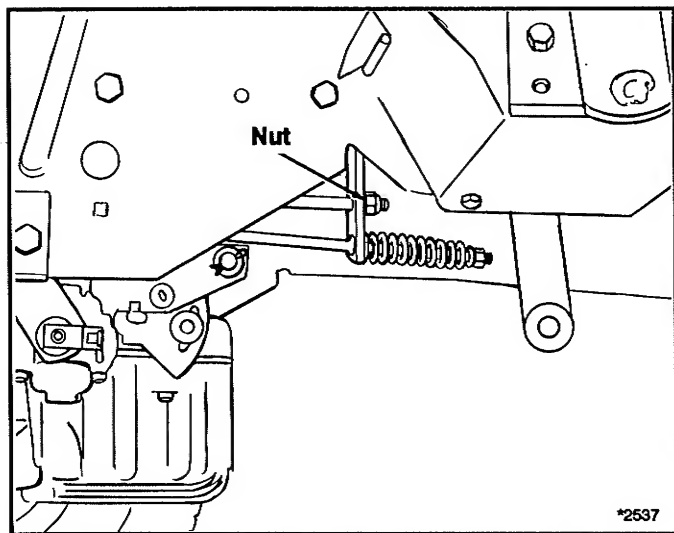
**B. Nut**

**C. Linkage Rod**

## Adjustments

### RETURN-TO-NEUTRAL ADJUSTMENT - HYDRO MODELS (Mfg. Nos. 1692259, 1692263)

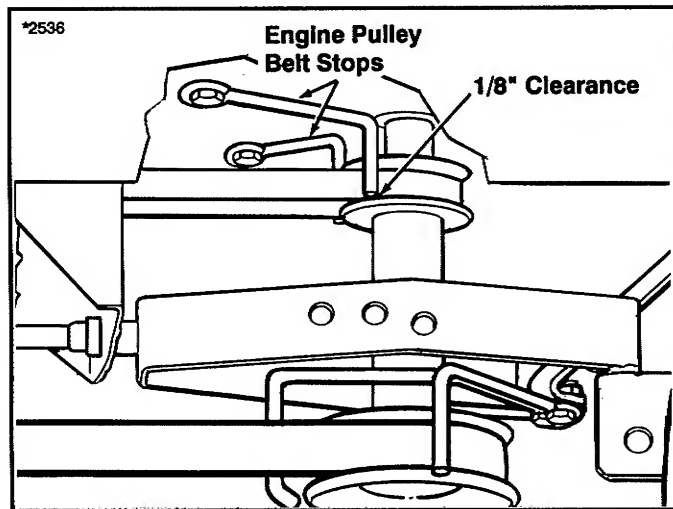
1. Depress clutch/brake pedal fully. Ground speed control lever should return to the neutral gate.
2. Turn nut in either direction until proper adjustment is achieved and control lever returns fully to the neutral gate.



**Figure 41. Return-To-Neutral Adjustment - Hydro Models (Mfg. Nos. 1692259, 1692263) (Viewed from right side of transaxle with the rear wheel removed)**

### ENGINE PULLEY BELT STOP

There should be 1/8" (3mm) between each belt stop and the belt when the tractor clutch is engaged (pedal up). See figure 42.

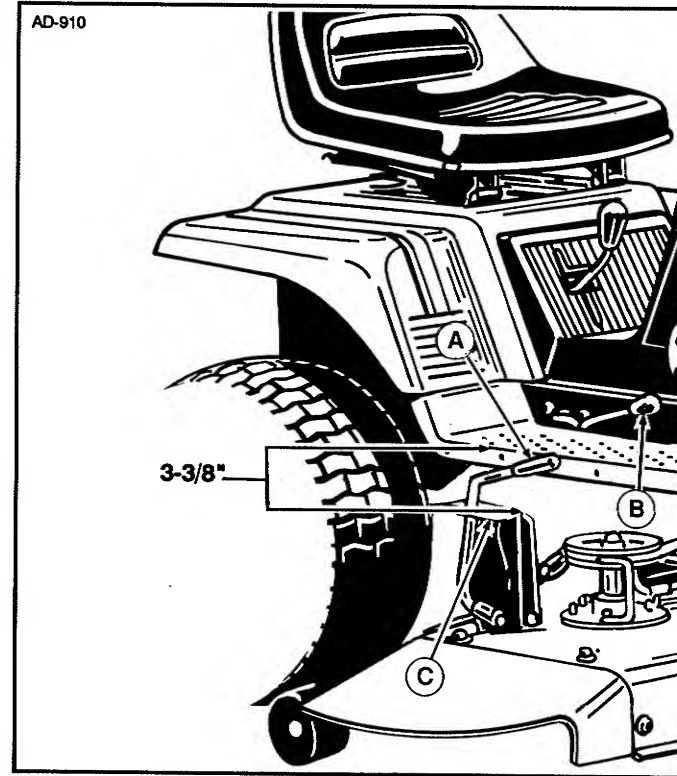


**Figure 42. Engine Pulley Belt Stops**

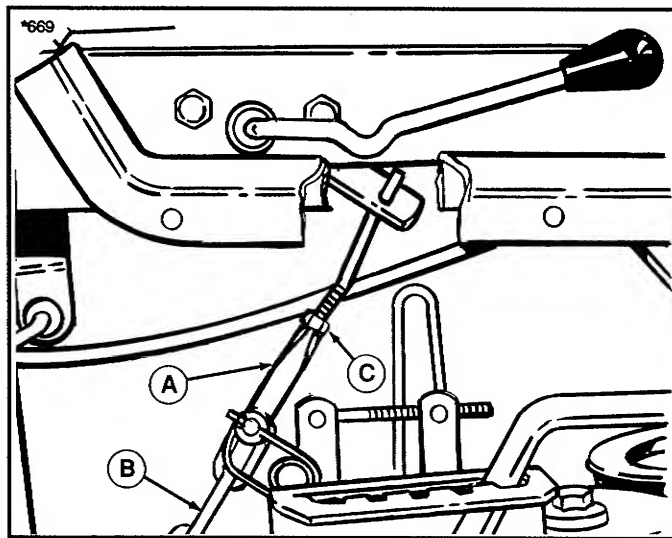
**SMALL LIFT LEVER - STANDARD**

The small lift lever is standard equipment on your tractor and is used to raise and lower the mower deck for transporting.

1. See figure 43. Use the mower height control lever (A) to place the mower in the lowest cutting position. Use the small lift lever (B) to fully raise the mower to the transport position.
2. Measure the distance between top of upstop bracket (C) and top of footrest. Measurement should be 3-3/8".
3. See figure 44. If adjustment is required, disconnect clevis (A) from the chain (B). Loosen nut (C) and turn clevis to raise or lower mower. When measurement is correct, tighten nut (C) against clevis (A).



**Figure 43. Small Lift Lever Measurement**  
**A. Mower Height Control Lever    C. Upstop Bracket**  
**B. Small Lift Lever**



**Figure 44. Lift Assembly Adjustment**

**A. Clevis**  
**B. Chain**

**C. Nut**

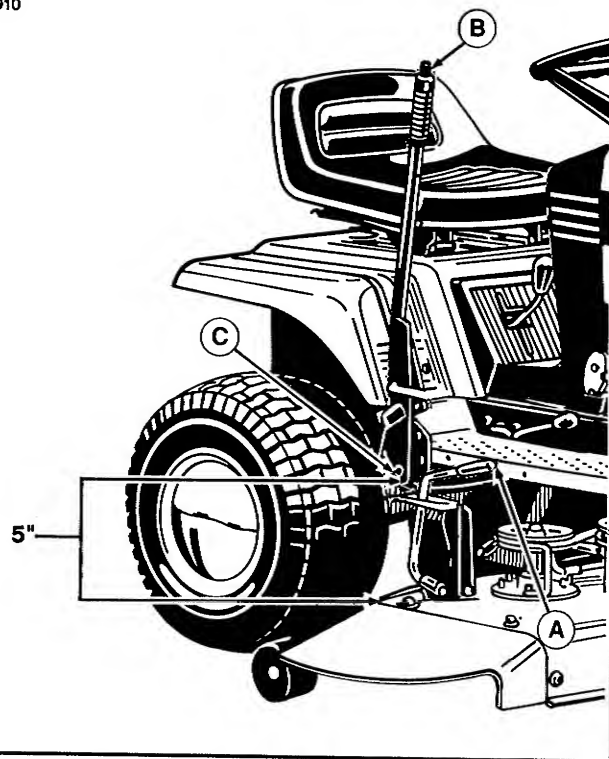
### **LARGE LIFT LEVER - OPTIONAL**

The large lift lever is optional, but is required with some attachments. It is used to raise and the lower the mower deck or attachments for transporting.

1. See figure 45. Use the mower height control lever (A) to place the mower in the lowest cutting position. Use the large lift lever (B) to fully raise the mower to the transport position.
2. Measure the distance from bottom edge of lever bracket (C) to mower deck as shown in figure 45. Measurement should be 5".
3. See figure 44. If adjustment is required, disconnect clevis (A) from the chain (B). Loosen nut (C) and turn clevis to raise or lower mower. When measurement is correct, tighten nut (C) against clevis (A).



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**Figure 45. Large Lift Lever Measurement**

**A. Mower Height Control Lever**

**C. Lever Bracket**

**B. Large Lift Lever**

### MOWER ADJUSTMENTS



#### WARNING

To prevent accidental starting, remove the ignition key, then disconnect the spark plug wire and fasten it away from the spark plug.

#### Leveling The Mower

If the cut is uneven, the mower may need leveling. Unequal or improper tire pressure may also cause an uneven cut. Tire pressure should be as follows:

Front: 12 - 15 psi (82-103 kPa)

Rear: 6 - 8 psi (41-55 kPa)

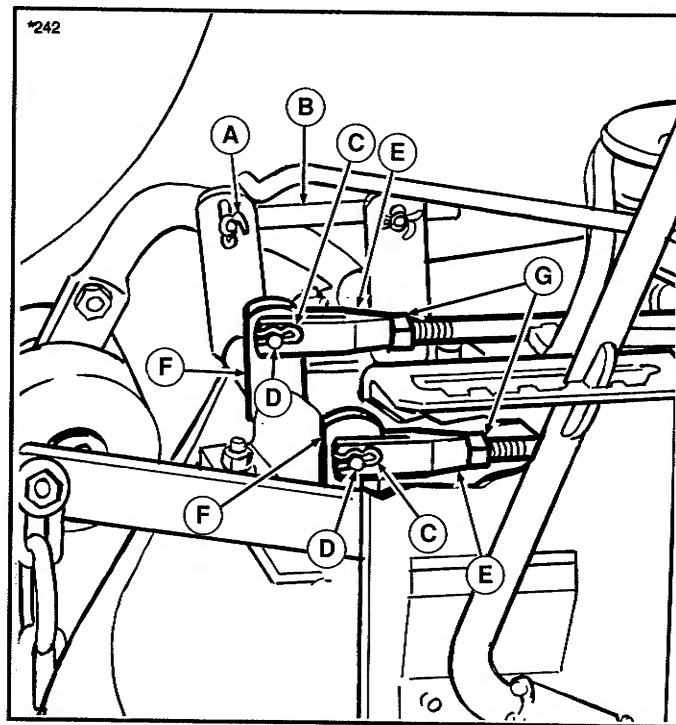
1. With the mower installed, place the tractor on a smooth, level surface such as a concrete floor. Turn the front wheels straight forward.
2. Check for bent blades and replace if necessary.
3. Disengage the PTO. Arrange the mower blades so that they are both pointing from side-to-side, then engage the PTO.

4. Measure the distance between the outside tips of each blade and the ground. If there is more than 1/8" (3mm) difference between the measurements on each side, proceed to step 5. If the difference is 1/8" (3mm) or less, proceed to step 6.
5. See figure 46. Remove the cotter pin (A) which secures the mower leveling rod (B). Shorten the rod to raise the left side of the mower, Lengthen the rod to lower the left side of the mower. After making adjustment, insert the leveling rod into the hole and re-check the measurements. If the mower is level, install the cotter pin (A).
6. Disengage the mower PTO. Arrange the blades so they face front-to-back, then engage the PTO.
7. Measure the distance to the ground from the front tip of the left blade and the rear tip of the right blade. The measurements should be equal. If they are not, proceed with steps 8 and 9.

8. Remove the clip pins (C) and clevis pins (D) from the hitch clevises (E). Turn each clevis an equal number of turns in the same direction. Shorten the hitch rods to raise the front of the mower, or lengthen the hitch rods to lower the front of the mower.

**NOTE:** One full turn of clevis will equal about  $1/8"$ .

9. After adjustment, attach clevises (E) to suspension arm (F) with clevis pins (D) and check the measurements. When the mower is level, reinstall the clip pins (C) and tighten nuts (G) against clevises.

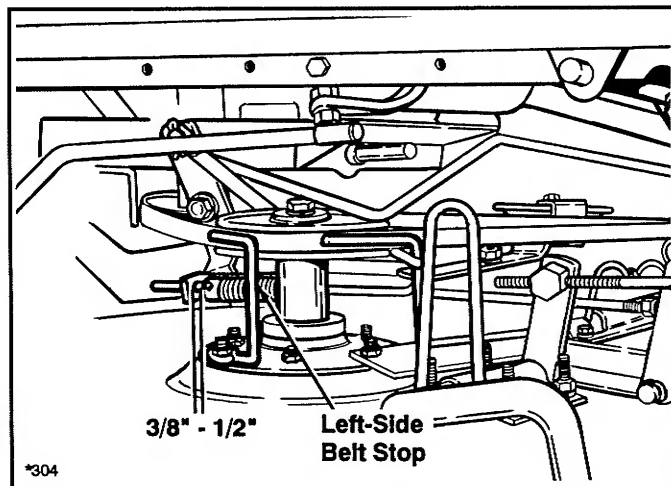


**Figure 46. Leveling The Mower**

- |                       |                     |
|-----------------------|---------------------|
| A. Cotter Pin         | E. Hitch Clevis (2) |
| B. Mower Leveling Rod | F. Suspension Arm   |
| C. Clip Pin (2)       | G. Nut (2)          |
| D. Clevis Pin (2)     |                     |

### Mower Belt Tension

1. Lower the mower using the lift lever.
2. Place the mower in the highest cutting position using the mower height control lever.
3. Place the PTO lever in the engaged position.
4. See figure 47. The gap between the rod guide and the set collar should measure  $3/8'' - 1/2''$  (10 - 13mm).
5. If adjustment is required, disengage the PTO and loosen the setscrew. Move the rod forward to increase the gap or back to decrease the gap, then tighten setscrew.
6. Engage the PTO and check the measurement. Readjust if necessary.



**Figure 47. Mower Belt Tension (Viewed from left side of tractor)**

M. Spark plug faulty, fouled, or incorrectly gapped.  
Clean & gap or replace.

N. Water in fuel tank. Drain fuel & refill with fresh fuel.

O. Old stale gas. Drain fuel & replace with fresh fuel.

**2. Engine starts hard or runs poorly.**

A. Fuel mixture too rich. Move control out of choke. If problem still exists, clean air filter.

B. Carburetor adjusted incorrectly. See your engine manual.

C. Spark plug faulty, fouled, or incorrectly gapped.  
Clean and gap or replace.

**3. Engine knocks.**

A. Low oil level. Check/add oil as required.

B. Using wrong grade oil. See Engine Manual.

**4. Excessive oil consumption.**

A. Engine running too hot. Clean engine fins, blower screen and air cleaner. See Normal Care section.

B. Using wrong weight of oil. See Engine Manual.

C. Too much oil in crankcase. Drain excessive oil.

**5. Engine exhaust is black or smoky.**

A. Dirty air filter. Clean air filter.

B. Choke not fully open. Move control out of choke and be sure choke opens fully. If problem still exists, check carburetor adjustment.

**6. Engine runs, but tractor will not drive or lacks power.**

A. Ground speed control lever in NEUTRAL. Shift into forward or reverse gate.

B. Drive belt slips. (See problem and cause below.)

C. Check hydro transmission oil (hydro models).

D. Brake is not fully released.

E. Transmission release lever is not fully in drive position (hydro models). See Pushing The Tractor By Hand.

**7. Drive belt slips.**

A. Clutch or belt tension is out of adjustment. See Adjustment section.

B. Pulleys or belt greasy or oily. Clean as required.

C. Belt stretched or worn. Replace with correct belt.

D. Clutch rod binding in guide. Oil clutch rod. See Tractor Lubrication.

### **8. Brake will not hold.**

- A. Brake is incorrectly adjusted. See Adjustment section.
- B. Brake pads worn & require replacement. See your dealer.

### **9. Tractor handles poorly.**

- A. Steering linkage is loose. Check and tighten any loose connections.
- B. Improper tire inflation. Check and correct.
- C. Wheels are spinning and slipping. Use weights to provide additional stability and traction.
- D. Moving too fast on slopes. Reduce speed.

### **10. Main tractor drive belt does not stop when clutch-brake pedal is depressed.**

- A. Belt stop out of adjustment. See Adjustments section.
- B. Belt tension out of adjustment. See Adjustments section.

### **11. Tractor will not move with ground speed control lever in forward or reverse.**

- A. Brake is not fully released. See Brake Adjustments.
- B. Transmission release lever is not fully in drive position (hydro models). See Pushing The Tractor By Hand.

### **12. Oil is leaking from the breather cap during normal operation (hydro models, Mfg. Nos. 1692259, 1692263).**

- A. Cooling fins are obstructed by grass clippings or dirt.
- B. The brake is stuck or not fully released. See Brake Adjustments - Hydro Models.

## **TROUBLESHOOTING (MOWER)**

### **1. Mower will not raise.**

- A. Lift chain not attached or broken. Attach or repair.

**2. Uneven cut.**

- A. Tractor tires not inflated equally or properly.
- B. Mower not leveled properly. See leveling adjustment in Mower Adjustment section.

**3. Mower cut is rough looking.**

- A. Engine speed too slow. Set for three-fourths to full speed.
- B. Tractor ground speed too fast. Use lower gear.
- C. Blades dull & require sharpening. See Normal Care section.
- D. Mower drive belt slipping. Belt oily or worn. Clean or replace belt as necessary. Readjust belt tension.

**4. Engine stalls easily with mower engaged.**

- A. Tractor ground speed too fast. Use lower gear.
- B. Engine speed too slow. Set for three-fourths to full speed.
- C. Cutting height set too low when mowing tall grass. Cut tall grass at maximum cutting height during first pass.
- D. Discharge chute jamming with cut grass. Cut grass with discharge pointing toward previously cut area.

**5. Excessive mower vibration.**

- A. Blade mounting screws are loose. Torque to 50 - 70 ft. lbs. (74 N.m). See Normal Care section.
- B. Mower blades, arbors, or pulleys are bent. Check and replace as necessary.
- C. Mower blades are out of balance. Remove, sharpen, and balance blades (see Normal Care section).

**6. Excessive belt breakage.**

- A. Belt tension too tight. Readjust belt tension.
- B. Bent or rough pulleys. Repair or replace.
- C. Using incorrect belt. See your dealer.

**7. Mower drive belt slips or fails to drive.**

- A. Mower drive belt out of adjustment. See Adjustment section.
- B. Mower drive belt broken. Replace belt.

## CHECKING THE BATTERY

The voltmeter can be used to determine condition of battery. When engine is off, the voltmeter shows battery voltage, which should be 12 volts. When engine is running, the voltmeter shows voltage of charging circuit which normally is 13 to 14 volts.

A dead battery or one too weak to start the engine may not mean the battery needs to be replaced. It may, as an example, mean that the alternator is not charging the battery properly. If there is any doubt about the cause of the problem, see your dealer. If you need to replace the battery, follow the steps under "Cleaning the Battery & Cables" in the Normal Care Section.

## CHARGING A COMPLETELY DISCHARGED BATTERY

1. Be aware of all the safety precautions you should observe during the charging operation. If you are unfamiliar with the use of a battery charger and hydrometer; have the battery serviced by your dealer.



### WARNING

**Do not attempt to charge a frozen battery. Allow the battery to warm to 60° F (15.5° C) before placing on charge.**

2. Add water sufficient to cover the plate (fill to the proper level near the end of the charge). If the battery is extremely cold, allow it to warm before adding water because the water level will rise as it warms. Also, an extremely cold battery will not accept a normal charge until it becomes warm.
3. Always unplug or turn the charger off before attaching or removing the clamp connections.
4. Carefully attach the clamps to the battery in proper polarity (usually red to [+] positive and black to [-] negative).



### CAUTION

**Keep open flames and sparks away from the battery; the gasses coming from it are highly explosive. Ventilate the battery well during charging.**



5. While charging, periodically measure the temperature of the electrolyte. If the temperature exceeds 125° F (51.6° C), or if violent gassing or spewing of electrolyte occurs, the charging rate must be reduced or temporarily halted to prevent battery damage.
6. Charge the battery until fully charged (i.e. until the specific gravity of the electrolyte is 1.250 or higher and the electrolyte temperature is at least 60° F). The best method of making certain a battery is fully charged, but not over charged, is to measure the specific gravity of a cell once per hour. The battery is fully charged when the cells are gassing freely at low charging rate and less than 0.003 change in specific gravity occurs over a three hour period.

### **JUMP STARTING WITH AUXILIARY (BOOSTER) BATTERY**

Jump starting is not recommended. However, if it must be done, follow these directions. Both booster and discharged batteries should be treated carefully when using jumper cables. Follow exactly the procedure that follows, being careful not to cause sparks. Refer to figure 30.



#### **WARNING**

**For your personal safety, use extreme care when jump starting. Never expose battery to open flame or electric spark – battery action generates hydrogen gas which is flammable and explosive. Do not allow battery acid to contact skin, eyes, fabrics, or painted surfaces. Batteries contain a sulfuric acid solution which can cause serious personal injury or property damage.**

1. Both batteries must be of the same voltage (6, 12, etc.).
2. Position the vehicle with the booster battery adjacent to the vehicle with the discharged battery so that booster cables can be connected easily to the batteries in both vehicles. Make certain vehicles do not touch each other.
3. Wear safety glasses and shield eyes and face from batteries at all times. Be sure vent caps are tight. Place damp cloth over vent caps on both batteries.
4. Connect positive (+) cable to positive post of discharged battery (wired to starter or solenoid).

*(Continued on next page)*

5. Connect the other end of same cable to same post marked positive (+) on booster battery.
6. Connect the second cable negative (-) to other post of booster battery.
7. Make final connection on engine block of stalled vehicle away from battery. Do not lean over batteries.
8. Start the engine of the vehicle with the booster battery. Wait a few minutes, then attempt to start the engine of the vehicle with the discharged battery.
9. If the vehicle does not start after cranking for thirty seconds, STOP PROCEDURE. More than thirty seconds seldom starts the engine unless some mechanical adjustment is made.
10. After starting, allow the engine to return to idle speed. Remove the cable connection at the engine or frame. Then remove the other end of the same cable from the booster battery.
11. Remove the other cable by disconnecting at the discharged battery first and then disconnect the opposite end from the booster battery.
12. Discard the damp cloths that were placed over the battery vent caps.



### **WARNING**

**To avoid engine damage, do not disconnect battery while engine is running. Be sure terminal connections are tight before starting.**



### **WARNING**

**Any procedure other than the preceding could result in: (1) personal injury caused by electrolyte squirting out the battery vents, (2) personal injury or property damage due to battery explosion, (3) damage to the charging system of the booster vehicle or of the immobilized vehicle.**

**Do not attempt to jump start a vehicle having a frozen battery because the battery may rupture or explode. If a frozen battery is suspected, examine all fill vents on the battery. If ice can be seen or if the electrolyte fluid cannot be seen, do not attempt to start with jumper cables as long as the battery remains frozen.**

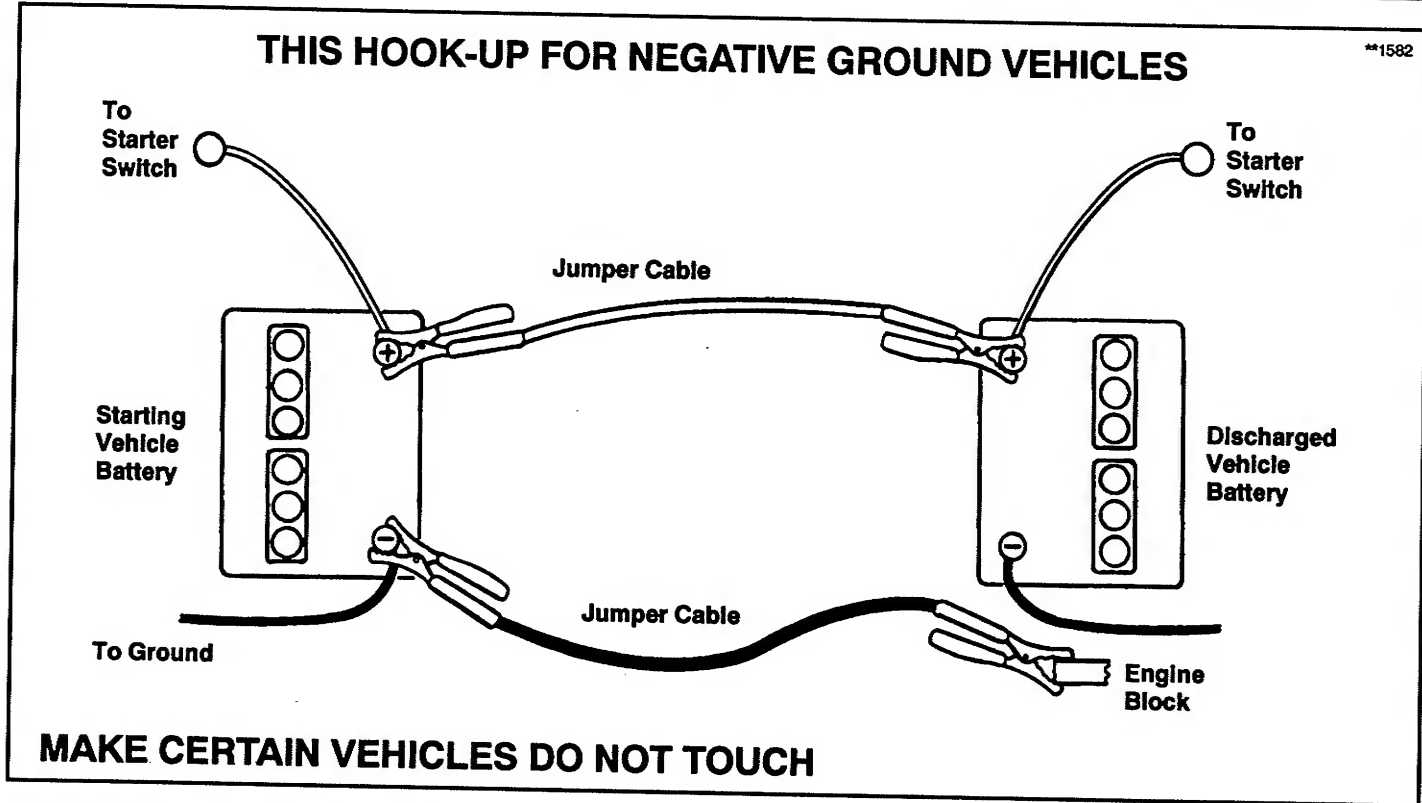


Figure 30. Jump Starting Diagram

## Adjustments

### SEAT ADJUSTMENT

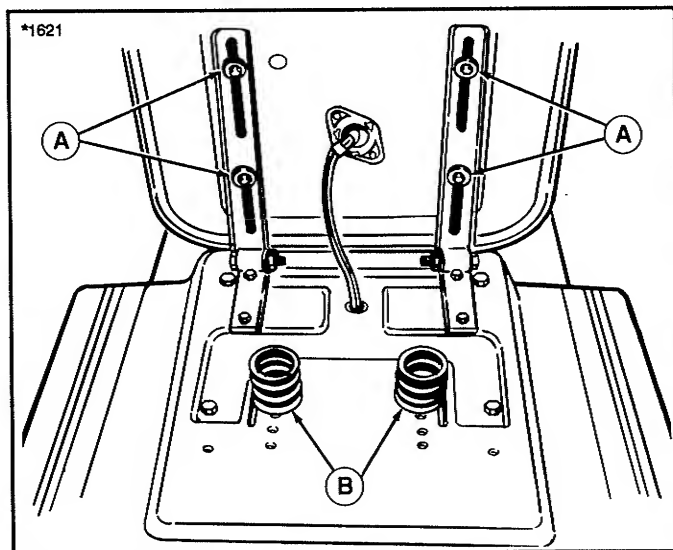


#### **WARNING**

To avoid serious injury, perform adjustments only with engine stopped, key removed and tractor on level ground.

Raise the seat deck. While holding the seat, loosen the four capscrews (A, figure 31) securing seat to deck. Position the seat as desired, then tighten the capscrews.

Seat springs (B, figure 31) can be adjusted for operator comfort. Move springs forward for lighter operator and toward the rear for heavier operator.

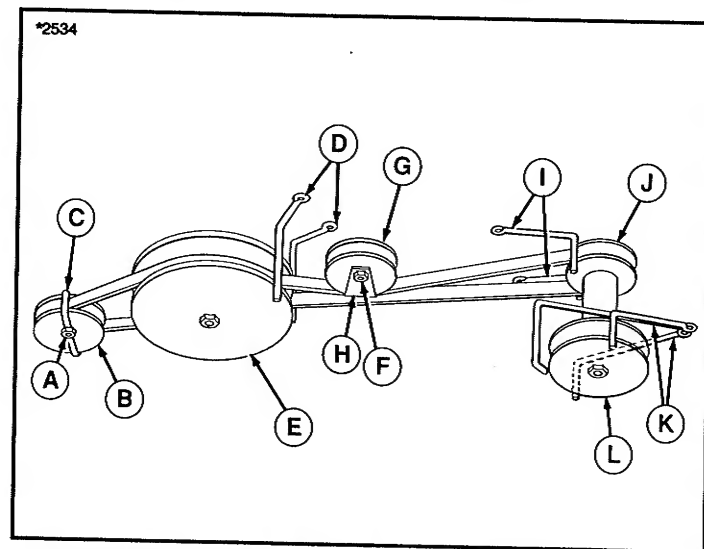


**Figure 31. Seat Adjustment**

**A. Capscrews**

**B. Springs**

5. See figure 56. Loosen nut (A) securing rear idler pulley (B) and belt stop (C). Slide pulley forward to release belt tension and remove belt from idler pulley.
6. Loosen belt stops (D) on transmission pulley (E) Slip the belt over the rear idler pulley and transmission pulley, then down between transmission gear shift brackets.
7. Loosen nut (F) securing idler pulley (G) and belt stop (H). Slip belt off idler pulley (G).
8. Loosen the belt stops (I) from the engine pulley (J). Loosen belt stops (K) from the PTO pulley (L).
9. Install the new belt by reversing steps 1 - 8. Be sure the V side of the belt is against all the pulleys except the flat idler pulley (G).
10. Reinstall belt on idler pulleys (B and G) and tighten nuts (A and F). Make sure pulleys can rotate freely after installation. The rear idler pulley belt stop (C) is self-indexing when nut (A) is tightened.
11. Perform all brake and belt stop adjustments. Make sure belt stops (D) are positioned 1/8" from belt. See Clutch Rod Adjustment to adjust the rear idler pulley (B) position.



**Figure 56. Drive Belt - Gear Model**

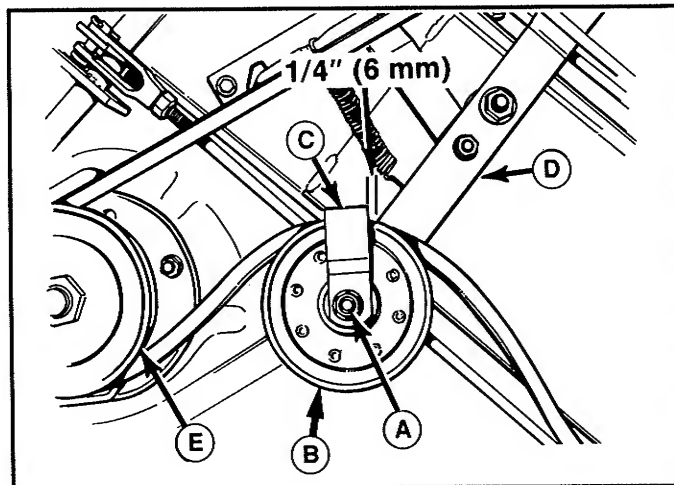
- |                                    |                              |
|------------------------------------|------------------------------|
| A. Nut                             | G. Idler Pulley              |
| B. Rear Idler Pulley               | H. Belt Stop, Idler Pulley   |
| C. Belt Stop, Rear Idler Pulley    | I. Belt Stops, Engine Pulley |
| D. Belt Stops, Transmission Pulley | J. Engine Pulley             |
| E. Transmission Pulley             | K. Belt Stops, PTO Pulley    |
| F. Nut                             | L. PTO Pulley                |

### MOWER BELT

Refer to figure 57.

1. Disengage the PTO and set the parking brake.
2. Remove the mower from the tractor. See Mower Installation & Removal in the Operation section.
3. Loosen the nut (A) on the idler pulley (B). Move and hold the idler arm (D) toward rear of mower deck to release blade brakes. Slip belt off left and right arbor pulleys.
4. Install the new belt on the pulleys as shown.
5. Reposition the belt guide (C) on the idler pulley (B). Before tightening the nut (A), position the belt guide so it is 1/4" (6mm) behind the idler arm (D) as shown in figure 57. Hold the belt guide in position when tightening nut.
6. Install the mower on the tractor. See Mower Installation & Removal in the Operation section. Check mower drive belt tension as outlined in the Adjustment section. Run the mower under no load condition for about 5 minutes. Recheck belt tension and blade brake adjustment after 1 hour of operation.

**NOTE:** Whenever changing mower belt tension, perform all other adjustments listed for the mower in the Adjustments section.



**Figure 57.**

- A. Nut**
- B. Idler Pulley**
- C. Belt Guide**
- D. Idler Arm**
- E. Right Arbor Pulley**

## Specifications

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### ENGINE

<b>Make:</b>	Briggs & Stratton - 4 cycle air cooled
<b>Model &amp; Type:</b>	See engine I.D. plate
<b>Horsepower:</b>	12.5 HP @ 3600 rpm (Eng. Mfg's. Rating)
<b>Cylinder:</b>	1 horizontal
<b>Bore &amp; Stroke:</b>	12.5 HP: 3.44 x 3.06 inches (87 x 78 mm)
<b>Displacement:</b>	12.5 HP: 28.4 cu. in. (465 cc)
<b>Crankshaft:</b>	Vertical, syncrobalanced
<b>Battery:</b>	12 volt 39 amp. hour
<b>Governor:</b>	Mechanical full throttle - no load setting @ 3400 $\pm$ 100 rpm; idle speed @ 1750 $\pm$ 200 rpm
<b>Crankcase Capacity:</b>	See engine manual
<b>Ignition:</b>	Electronic
<b>Charging:</b>	Unregulated 3-amp DC charging circuit
<b>Air Cleaner:</b>	Oil foam with reuseable polyurethane element
<b>Fuel Tank:</b>	2.2 gallons (8.3 liters) of "regular" grade leaded or unleaded gasoline.
<b>Starter:</b>	12 volt electric gear drive

### TRANSMISSION (Hydro)

<b>Type:</b>	Belt drive to hydrostatic transmission
<b>Differential:</b>	Gear reduction unit
<b>Ground speeds @ 3400 rpm:</b>	
	Forward - 0-4.8 mph
	Reverse - 0-2.6 mph

### TRANSMISSION (Gear)

<b>Type:</b>	Spur gear trans. w/5 speed forward & 1 reverse
<b>Differential:</b>	Bevel gear type
<b>Ground speeds @ 3400 rpm:</b>	
	1st gear - .9 mph (1.5 km/h)
	2nd gear - 1.8 mph (2.9 km/h)
	3rd gear - 2.6 mph (4.2 km/h)
	4th gear - 3.7 mph (5.0 km/h)
	5th gear - 4.0 mph (6.4 km/h)
	Reverse - 1.9 mph (3.4 km/h)

### DIMENSIONS & WEIGHT

<b>Height (at steering wheel):</b>	39 in. (99 cm)
<b>Width:</b>	33.75 in. (88 cm)
<b>Length:</b>	65.25 in. (166 cm)
<b>Clearance - Front Axle:</b>	9 in. (228 mm)
<b>Clearance - Transmission:</b>	6 in. (152.4 mm)
<b>Wheel Base:</b>	45.5 in. (1156 mm)
<b>Turning Radius:</b>	24 in. (610 mm) to inside of rear wheel
<b>Front Tires:</b>	15 x 6.00 x 6 Pneumatic
<b>Rear Tires:</b>	18 x 8.50 x 8 Pneumatic

**SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.**

## Parts Manual Availability \_\_\_\_\_

Parts Manuals are fully illustrated. All of the assemblies are shown in exploded views which show the relationship of the parts and how they go together. Important assembly notes and special torque values are included in the illustrations. For standard hardware, a torque specification chart is included.

For the manual applicable for your model, contact the Simplicity Customer Publications Department at (414) 284-8519. Have the following information available when phoning in your request.

**Model:** \_\_\_\_\_

**Mfg. No.:** \_\_\_\_\_

**Your Name:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**City, State, Zip:** \_\_\_\_\_

**Visa/MasterCard No.:** \_\_\_\_\_

**Expiration Date:** \_\_\_\_\_

**Allow 3-4 weeks for delivery.**



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**Notes**

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**Notes**

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# International Symbols

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Choke



Fast



Slow



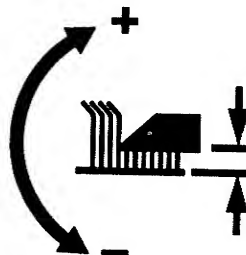
Engine Running



PTO Engaged



Parking



Mower Cutting Height

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